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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,410	10/15/2001	Lyndon W. Graham	114183.00010	4366
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EXAMINER				
LEADER, WILLIAM T				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/977,410

Applicant(s)

GRAHAM ET AL.

Examiner

WILLIAM T. LEADER

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35, 36 and 38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 35, 36 and 38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

1. In the Remarks filed on October 15, 2001, applicant stated that claims 35 to 38 had been added to the application. These claims corresponded to claims 1, 2, 5 and 19 of U. S. Patent No. 6,132,587.
2. During the prosecution of the application, claim 37 was canceled. On October 30, 2006 applicant appealed the final rejection of claims 35, 36 and 38. Claim 36 was finally rejected as being anticipated by Mori (US 5,443,707). The Board of Patent Appeals and Interferences (BPAI) affirmed the rejection of claim 36. Claims 35 and 38 were finally rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The rejection of these claims was reversed. In section E 1 of the decision, the BPAI noted that applicant relied on diffusion plate 375 illustrated in Figure 8 as well as page 21, line 23 through page 22, line 2 of the original disclosure to establish written description support for the "porous separator" recited in claim 35. At page 6 of the decision, the BPAI stated

The Appellants argue that the original disclosure describes openings of any size that permit the uniform distribution of liquid over the surface of wafer. Since "holes" and "pores" are both capable of performing that function, the Appellants argue that the original disclosure provides written description support for the "porous separator" recited in claim 35. Br. 9-10.

The Appellants' position is supported by the record. The portion of the original disclosure relied on by the Appellant describes the openings depicted in Figure 8 as "fluid passages." The original disclosure does not expressly limit the size of the fluid passages but merely requires the fluid passages to allow the "communication" of fluid through the diffusion plate 375. Spec. 22:1-2. We find that one of ordinary skill in the art would have understood that "holes" as well as "pores" would permit the communication of fluid through the diffusion plate 375. Therefore, it is reasonable to find that the original disclosure conveys possession of a "porous separator" as recited in claim 35.

In section E.2 of the decision, the BPAI additionally noted that applicant relied on the diffusion plate 375 illustrated in Figure 8 as well as page 21, line 23 through page 22, line 2 of the original disclosure to establish written description support for the distributor recited in claim 38. At page 7 of the decision, the BPAI stated

The Appellants argue that the original disclosure describes the function of the diffusion plate 375 as ensuring more even distribution of the plating fluid across the wafer and discloses that fluid passages are provided "over all or a portion" of the diffusion plate. Spec. 22:1-2. The Appellants contend that "passages over all of the diffusion plate necessarily means that the openings extend over a diameter of the wafer along two radiuses." Br. 10. Thus, the Appellants argue, one skilled in the art would understand that uniformity "along a radius of the disk" as recited in claim 38 is supported by the original disclosure. *Id.*

The Appellants' position is supported by the record. As pointed out by the Appellants, the original disclosure states that the diffusion plate provides a "more even distribution of the fluid plating bath across the wafer W," and "[f]luid passages are provided over all or a portion of the diffusion plate 375." Spec. 21:23-22:2. We find that this disclosure reasonably conveys possession of a diffusion plate having fluid passages provided over the entire diffusion plate, including along a radius thereof. We also find that this disclosure reasonably conveys possession of a diffusion plate having fluid passages that provide an even or uniform distribution of the plating bath through the diffusion plate, including along a radius thereof.

3. The statement by the BPAI that both holes and pores in a plate are capable of performing the function of permitting the uniform distribution of liquid over the surface of a wafer requires a reevaluation of the prior art. The Simpson patent US 6,174,425 is pertinent to the claimed subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 35 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Simpson (US 6,174,425).

6. The Simpson et al patent (hereinafter Simpson) discloses an electroplating device for the metallization of a semiconductor wafer. A prior art electroplating system is shown in figure 1 and described at column 1, lines 29-46. The system includes cup 12. This cup corresponds to the reservoir recited in instant claim 35. The system includes turntable 151 and fingers 152 which are adapted to hold the wafer above the cup. These correspond to the holder recited in claim 35. The system includes anode 14 positioned in the cup. This anode corresponds to the counter-electrode recited in claim 35. Simpson discloses that the turntable and clamp fingers are the cathode for the system. The anode 14 and clamp fingers 152 are biased to plate the substrate 20. By disclosing this biasing to plate the substrate, Simpson indicates the presence of a means for passing current between the counter-electrode (anode) and the wafer (cathode). Simpson teaches that the plating solution enters the cup through the inlet part 112 and flows by the anode 14. The flow of plating solution is illustrated by the arrows in figure 1. By disclosing the flow of plating solution, Simpson indicates the presence of a pump. The system of Simpson

additionally includes diffuser 13 which is a separator between the wafer holder and anode counter-electrode. Figure 1 shows a series of holes in the diffuser through which the plating solution flows as shown by the arrows. Since the plating solution flows through the diffuser, it is clearly porous within the meaning given to this term by the BPAI. All elements of the device recited in claim 35 are disclosed by Simpson.

7. Claim 38 is similar to claim 35 but recites a distributor including a disk having a plurality of holed adapted to a flow of electrolyte through the disk that is uniform along a radius of the disk. The diffusion plate 375 as depicted in applicant's figure 8 has a series of uniformly sized holes uniformly distributed across the plate. Diffuser 13 of Simpson as depicted in figure 1 similarly has a series of uniformly sized holes uniformly distributed across the plate. As suggested by the arrows, flow would be uniform along a radius of the disk.

8. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Mori (US 5,443,707) for the reasons given in the Examiner's Answer and affirmed by the Board of Patent Appeals and Interferences.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 35 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson et al (US 6,174,425) in view of Lytle et al (US 5,391,285).

12. The Simpson patent is interpreted and applied as above, and is taken to suggest the inclusion of a means for passing an electric current and a pump. However, these elements are not illustrated in the figure of Simpson. Should Simpson be interpreted as not specifically suggesting an electric power supply and a pump, inclusion of these elements would have been obvious in view of Lytle. The Lytle et al patent (hereinafter Lytle) is directed to an electroplating device for the metallization of a semiconductor. The device is illustrated in figure 1. It includes a tank 12 which holds electroplating solution 11, means for holding a semiconductor wafer 32, an anode counter-electrode 24, a power supply 36 for passing electric current between the anode counter-electrode and the wafer 32, and a pump 14 for pumping plating solution toward the wafer. It would have been obvious to have utilized a power supply to provide electric current and a pump to provide electrolyte flow in the electroplating system of Simpson because these devices are well-known in the art for achieving these objectives as shown

by Lytle. Lytle additionally teaches that a uniform flow of electroplating solution is important during the electroplating process to provide even deposition of the metal ions from the plating solution onto the plating sites (column 1, lines 47-49).

13. With respect to claim 38, should Simpson be interpreted as not specifically suggesting that the flow of electrolyte through the diffuser be uniform along a radius, it would have been obvious to have provided a uniform flow of electrolyte because it is recognized that a uniform flow is important to provide even deposition as taught by Lytle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/
May 21, 2010

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Supervisory Patent Examiner, Art Unit 1795

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Director's designee for reopening after BPAI decision